Amendments To The Claims

The listing of claims presented below will replace all prior versions, and listings, of claims in the application.

Listing of claims:

1. **(currently amended)** A method for fabricating an isolation layer in a semiconductor device, the method comprising the steps of:

forming a trench on a semiconductor substrate;

forming a flowing insulating layer within the trench**, wherein the flowing insulating layer comprises an SHO (SiO_xH_y; the value of x falls in the range of 0 ~ 3, and that of y falls in the range of 0 ~ 1) insulating layer**;

making the insulating layer precise; and

forming a precise insulating layer over an upper surface of the whole structure on which the flowing insulating layer is formed.

2. (original) The method as claimed in claim 1, further comprising a step of carrying out a pretreatment by an in-situ prior to forming the flowing insulating layer, wherein the pretreatment step is carried out by a cleaning treatment or a plasma treatment.

3. (original) The method as claimed in claim 2, wherein the plasma treatment is carried out for at least 5 seconds at a pressure below 100 Torr with a plasma using SiH_4, $SiH_a(CH_3)_b$ (the value of a falls in the range of 0 ~ 4, and that of b falls in the range of 0 ~ 4), N_2, N_2O, NH_3, O_2, O_3, Ar or He gas.

4. (original) The method as claimed in claim 1, further comprising a step of oxidizing sidewalls of the trench prior to forming the flowing insulating layer.

5. (original) The method as claims in claim 4, the oxidizing step is carried out at a furnace maintained at more than 600°C to form an oxide film ranging from 20 to 200Å.

6. (original) The method as claimed in claim 4, further comprising a step of forming a nitride film within the trench according to an LPCVD or an ALD manner after oxidizing the sidewalls of the trench.

7. (original) The method as claimed in claim 1, further comprising a step of sequentially forming a nitride film and an oxide film at an inner surface of the trench prior to forming the flowing insulating layer.

8. **(cancelled)**

9. **(currently amended)** The method as claimed in **claim 1** ~~claim 8~~, wherein the flowing insulating layer using SHO is formed to a thickness ranging from 50 to 5000Å.

10. **(currently amended)** The method as claimed in **claim 1** ~~claim 8~~, wherein the SHO insulating layer used as a flowing insulating layer is formed by using a reaction source of SiH_4 and H_2O_2 by way of an in-situ according to an LPCVD process.

11. (original) The method as claimed in claim 10, wherein the SHO insulating layer is formed at a temperature ranging from –10 to 150°C and at a low pressure below 100 Torr using a reaction gas of SiH_4, $SiH_a(CH_3)_b$ (the value of a falls in the range of 0 ~ 4, and that of b falls in the range of 0 ~ 4), H_2O_2, O_2, H_2O and N_2O gas.

12. The method as claimed in claim 1, further comprising a step of post-cleaning the flowing insulating layer, wherein the post-cleaning step is carried out sequentially and simultaneously according to one or more methods selected from the following cleaning manners: 1) cleaning at a temperature ranging from room temperature to 150°C with using a BOE (buffered oxide etchant) solution, which comprises an etching solution and

a buffer solution in a ratio ranging from 3:1 to 500:1, or with using a mixed solution made of H_2SO_4 and H_2O_2 solution in a volume ratio ranging from 1:1 to 500:1, 2) cleaning by means of wet-etching with using SC-1 (standard cleaning-1), SC-2 (standard cleaning-2) cleaning solution after diluting with 5:1 ~ 500:1 HF.

13. (original) The method as claimed in claim 1, wherein the step of making the flowing insulating layer precise is carried out in an atmosphere of O_2, N_2, O_3, N_2O, and H_2+O_2 mixed gas at a temperature ranging from 300 to 850°C for more than 1 minute or carried out in an atmosphere of O_2, N_2, O_3, N_2O, and H_2+O_2 mixed gas at a temperature ranging from 300 to 12000°C for more than 5 minutes or carried out by performing an RTP (Rapid Thermal Process) at a temperature more than 600°C for more than one second.

14. (original) The method as claimed in claim 1, wherein the step of making the flowing insulating layer precise is carried out at a pressure ranging from 0 mTorr to 10 Torr and for more than 5 ~ 300 seconds by means of a plasma using SiH_4, $SiH_a(CH_3)_b$ (the value of a falls in the range of 0 ~ 4, and that of b falls in the range of 0 ~ 4), N_2, NH_3, O_2, O_3, N_2O, Ar or He gas.

15. (original) The method as claimed in claim 1, wherein the precise insulating layer comprises a HDP or a USG film.

16. (original) The method as claimed in claim 1, further comprising a step of heat treatment of the resultant substrate after the formation of the precise insulating layer, wherein the heat treatment is carried out in an atmosphere of O_2, N_2, O_3, N_2O, and H_2+O_2 mixed gas at a temperature ranging from 300 to 12000°C for more than 5 minutes or by performing an RTP (Rapid Thermal Process) at a temperature more than

600°C for more than one second.

17. **(currently amended)** A method for fabricating an isolation layer in a semiconductor device, the method comprising the steps of:

providing a semiconductor substrate on which a trench is formed;

carrying out a pretreatment of the trench;

forming a flowing insulating layer below the pretreated trench;

post-cleaning the flowing insulating layer;

making the insulating layer precise;

forming an insulating layer on an upper surface of whole structure on which the precise ~~flowing~~ insulating layer so formed; and

forming a thermal-insulating layer above the insulating layer.

18. (original) The method as claimed in claim 17, further comprising a step of a plasma treatment or an annealing treatment prior to the post-cleaning treatment of the flowing insulating layer.

19. (original) The method as claimed in claim 17, wherein the post-cleaning step is carried out sequentially and simultaneously according to one or more methods selected from the following cleaning manners: 1) cleaning at a temperature ranging from room temperature to 150°C with using a BOE (buffered oxide etchant) solution, which comprises an etching solution and a buffer solution in a ratio ranging from 3:1 to 500:1, or with using a mixed solution made of H_2SO_4 and H_2O_2 solution in a volume ratio ranging from 1:1 to 500:1, 2) cleaning by means of wet-etching with using SC-1 (standard cleaning-1), SC-2 (standard cleaning-2) cleaning solution after diluting with 5:1 ~ 500:1 HF.

20. (original) The method as claimed in claim 17, wherein the pretreatment step comprises a cleaning or a plasma treatment.

21. (original) The method as claimed in claim 17, wherein the precise insulating layer is deposited by way of an HDP-CVD manner using a SiH_4, reaction gas or an AP-CVD manner using a TEOS reaction gas.

22. (original) The method as claimed in claim 17, wherein the insulating layer is formed by carrying out in an atmosphere of O_2, N_2, O_3, N_2O, and H_2+O_2 mixed gas at a temperature ranging from 300 to 12000°C for more than 5 minutes or by performing an RTP (Rapid Thermal Process) at a temperature more than 600°C for more than one second.

23. (original) The method as claimed in claim 17, the thermal insulating layer is deposited by way of an HDP-CVD manner using a SiH_4 reaction gas or an AP-CVD, an SA_CVD manner using a TEOS reaction gas.